What we claim is new is:

1. A relatively low cost, high toughness, high strength Cu/Ni/Cr alloy steel suitable for manufacturing a wide range of articles requiring high strength and toughness, comprising by weight: about 0.40-1.0% copper; about 0.80-3.5% of chromium; about 2.5 - 8.0% nickel; about 0.55-1.50% of silicon; about 0.15-1.50% manganese; at least one of the transitional elements, vanadium in about 0.10-1.00% by weight and titanium in about 0.10 - 0.65% by weight; and the remainder iron, carbon and incidental impurities.

2. A relatively low cost, high toughness, high strength Cu/Ni/Cr alloy steel suitable for manufacturing a wide range of articles requiring high strength and toughness comprising about 0.50-0.70% by weight of copper; about 0.75-1.50% by weight of silicon, said copper and said silicon being present in a Si to Cu weight ratio of about 1.0 - 2.5; about 0.80-2.20 by weight of chromium; about 1.0 - 6.0% by weight of nickel; about 0.35-0.50 by weight of carbon; about 0.65-1.20% by weight of manganese; at least one of the transitional elements, vanadium in about 0.10-1.00% by weight and titanium in about 0.10 - 0.65% by weight; and the remainder iron and incidental impurities.

3. A relatively low cost high toughness, high strength Cu/Ni/Cr alloy steel comprising by weight about 0.4 to1.0% Cu, about 1.0 to 8.0% of Ni, about 0.8 to 3.5% Cr, about 0.55 to 1.5% Si, at least one of the transitional elements, vanadium in about 0.10-1.00% by weight and titanium in about 0.10 - 0.65% by weight and characterized by the presence of retained austenite after quenching from an austenitizing temperature, said steel having a microstructure comprised of a major phase of lath martensite enveloped by a minor phase of retained austenite.

4. The steel recited in claim 3 wherein said medium carbon Cu/Ni/Cr steel comprises by weight about 0.35 to 0.55% C and about 0.65 to 1.20% Mn.

5. A rolled or forged article of relatively low cost, high toughness, high strength Cu/Ni/Cr alloy steel having after quenching and tempering an HRC hardness of at least 50 a yield strength of at least 200 ksi and an impact strength value KcV of at least 28 ft-lb, comprising by weight percent: about 0.50-0.70% of copper; about 0.80-3.50% of chromium; about 2.0 - 8.0% nickel; about 0.35-0.50% carbon; about 0.75-1.50% silicon; about 0.65-1.20% manganese; at least one transitional element; and the remainder iron and incidental impurities.

6. The article recited in claim 5 wherein said transitional element by weight is about 0.10-1.00% vanadium.

7. The article recited in claim 5 wherein said transitional element by weight is about 0.10 - 0.65% titanium.

8. An article of relatively low cost, high toughness, high strength Cu/Ni/Cr alloy steel consisting by weight percent essentially of: 0.22-0.32 carbon, about 0.40-1.0% copper; about 0.80-1.5 of chromium; about 1.0 - 3.5% nickel; about 0.75-1.00% silicon; about 0.65-1.00% manganese; at least one from a group of transitional elements: about 0.10-0.50% of vanadium, 0.10 - 0.35% titanium; and the remainder iron and incidental impurities and having high core strength and toughness after carburizing.

9. An article of relatively low cost, high toughness, high strength Cu/Ni/Cr alloy steel

consisting by weight percent essentially of: about 0.32-0.55 carbon, about 0.75-1.00% of silicon; about 0.40-1.0% copper; about 0.80-3.5% of chromium; about 1.0 - 3.5% nickel; about 0.65-1.00% manganese; at least one from a group of elements: about 0.10-1.0% of vanadium, 0.10 - 0.65% titanium; and the remainder iron, carbon and incidental impurities and having after nitriding exceptionally deep and hard outer case and high core strength and toughness.

10. A rolled or forged article made from a relatively low cost high toughness, high strength, Cu/Ni/Cr alloy steel comprising by weight about 0.4 to1.0% Cu, about 2.0 to 8.0% of Ni, about 0.8 to 3.5% Cr, about 0.55 to 1.5% Si, at least one from a group of transitional elements: about 0.10-0.50% of vanadium, 0.10 - 0.35% titanium, and characterized by the presence of retained austenite after quenching from an austenitizing temperature, said steel having a microstructure comprised of a major phase of lath martensite enveloped by a minor phase of retained austenite and a hardness of at least HRC 50, a yield strength of at least about 200 ksi and a Charpy impact value KcV of about at least 28 ft-lb.

11. A method for producing a relatively low cost, high toughness, high strength Cu/Ni/Cr alloy steel comprising the steps of: adding to said steel in a molten state, by weight about 0.4 - 1.0% weight copper and about 0.55 - 1.5% silicon wherein the ratio of Si to Cu is approximately within the range of 1.0 - 2.5; selecting desired levels of yield strength and toughness; adding in said molten state an amount of Ni within a range by weight of about 1.0 to 8.0% for meeting said desired levels of yield strength and toughness; selecting desired levels of hardness and ultimate strength; adding in said molten state an amount of carbon within a range by weight of about 0.22 to 0.55% for meeting said selected levels of hardness and ultimate strength; casting and forming said steel; quenching said steel from an austenitizing temperature to form a microstructure having

a major phase of lath martensite enveloped by a minor phase of retained austenite.

12. The method recited in claim 11 further comprising the step of adding in said molten state by weight about 0.10-1.0% vanadium.

13. The method recited in claim 11 further comprising the step of adding in said molten state by weight about 0.10 - 0.65% titanium.

14. The method recited in claim 11, wherein said medium carbon Fe/Cr/C/Mn alloy steel comprises by weight about 0.8 to 3.5% Cr and about 0.65 to 1.2% Mn.